

Case 2899

Dodecaceria concharum* Örsted, 1843 and *Heterocirrus fimbriatus* Verrill, 1879 (currently *D. fimbriata*) (Annelida, Polychaeta): proposed conservation of the specific names by the designation of a neotype for *D. concharum

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Abstract. The purpose of this application is to conserve, by designation of a neotype for *Dodecaceria concharum* Örsted, 1843, the general usage of this name for a parthenogenetic species, and of *D. fimbriata* (Verrill, 1879) for a sexually and asexually reproducing species, of cirratulid polychaetes from Europe. There is circumstantial evidence that Örsted's original material may have been *D. fimbriata* but it is proposed that a neotype for *D. concharum* be designated in accord with usage. *D. concharum* is the type species of *Dodecaceria* Örsted, 1843 by monotypy.

1. *Dodecaceria* Örsted, 1843 (p. 44) is a worldwide genus of tube-dwelling cirratulid polychaetes. In the north-east Atlantic the two species discussed here live in flask-shaped tubes in shallow water, often forming dense colonies in calcareous substrates such as the encrusting alga *Lithothamnion* or the shells of bivalve molluscs. Örsted described the nominal species *D. concharum* on the basis of specimens found in 'wormed' shells taken from oyster beds on the Danish side of the Öresund, between Fredrickshavn and Skagen and near Hellebæk. He failed to describe a pair of tentacles ventral to the first pair of branchial cirri and did not indicate either the presence or absence of eyes or nuchal organs. Nevertheless, Örsted's original description and figure were such that later authors felt able to use his specific name even though the type material is not extant (Wolff & Petersen, 1991, p. 672).

2. *Terebella ostreae* Dalyell, 1853 (p. 209, pl. 26, fig. 10) was also described from old oyster shells. No type locality is mentioned but Dalyell's specimens, which included both adults and juveniles, were very probably from the Firth of Forth, Scotland. Johnston (1865, p. 212) synonymized this taxon with *D. concharum* Örsted, 1843 and recorded specimens from Berwick Bay and Falmouth, England. This synonymy was accepted by subsequent authors, including McIntosh (1915), Fauvel (1927) and Hartman (1959). However, further work by Gibson (in press) on the northern distribution of the two species in relation to the salinity suggests that Dalyell's species was more probably *D. fimbriata*. *Terebella ostreae* is best regarded as a nomen dubium but is a threat to the stability of *D. fimbriata*; we therefore propose that it be suppressed.

3. *Heterocirrus* Grube, 1855 was established for a single species *Heterocirrus saxicola* Grube, 1855 (p. 109, pl. 4, fig. 11) described from Villafranca (i.e. Villefranche, France). Grube noted that the tentacles each bear a ciliated groove and occur on the buccal segment together with the first pair of branchial cirri. Quatrefages (1865, pp. 454, 464–467), misled by the supposed absence of tentacles in *Dodecaceria* (but not in *Heterocirrus*), kept the two genera separate. *Dodecaceria* remained monotypic for *D. concharum*, but in *Heterocirrus* Quatrefages included not only *H. saxicola* Grube, 1855 but also *H. frontifilis* Grube, 1863 and *H. multibranchis* Grube, 1863 and a new species *H. ater*. One of the characters claimed by Quatrefages to distinguish *Dodecaceria* from *Heterocirrus* was the presence of eyes in the latter genus, although he thought they might be absent from the type species *H. saxicola*. In fact the two rows of minute 'eyes', which he described for *H. ater*, are the nuchal organs.

4. Marion & Bobretzky (1875, p. 67) synonymized *H. saxicola* Grube, 1855 with *D. concharum* Örsted, 1843. This synonymy has been confirmed by one of us (P.H.G.), who examined Grube's specimens from Villefranche, assumed to be the type material of *H. saxicola* (1 specimen + fragment: catalogue no. Q.4559, Zoologisches Museum, Berlin). *H. ater* was synonymized with *D. concharum* by Langerhans (1881, p. 96).

5. Saint-Joseph (1894, pp. 42–58), in a revision of cirratulid genera, accepted the heterogenous nature of *Heterocirrus* sensu Quatrefages. He excluded both *H. saxicola*, although this was the type species, and *H. ater*, and redefined the genus to accommodate *H. multibranchis* and seven other species. *Heterocirrus* was maintained as a genus distinct from *Dodecaceria* by several subsequent authors (e.g. McIntosh, 1915 and Fauvel, 1927) but, as it was originally established as a monotypic genus for *H. saxicola*, it can only be a junior subjective synonym of *Dodecaceria*. The generic name *Heterocirrus* is not now in use, although Cabioch, L'Hardy & Rullier (1968) used that name for three species of *Caulleriella*. The species of *Heterocirrus* sensu Saint-Joseph are now placed in *Aphelochaeta* Blake, 1991 (= *Tharyx* auctt., non Webster & Benedict, 1887) and *Caulleriella* Chamberlin, 1919.

6. The abundant populations of *D. concharum* from the extensive *Lithothamnion* biotope on the French coast of the English Channel in the region of La Hague, near Cherbourg, were investigated by Caullery & Mesnil (1898). They concluded that the species was heteromorphic, with three separate and independent series of individuals, each with a different reproductive strategy. These series were termed forms A, B and C. Form A was the commonest, representing about 90% of the individuals studied. All specimens of form A were female. This form did not appear to undergo metamorphosis and was assumed to remain a sedentary atoke throughout its life. Reproduction was parthenogenetic and viviparous. Sexually reproductive adults of form B were free-swimming epitokes (B_2) with equal numbers of males and females, but for form C only one large epitoke (C_2) was found. The atokes of these forms and their characteristic chaetae were described, with figures of those of A, B_1 and B_2 . All individuals of form C were females but were not viviparous. After discussing whether these forms should be assigned to more than one species, Caullery & Mesnil concluded that only one polymorphic species should be recognized.

7. McIntosh (1911) observed in the Channel Islands two forms, referred to as *D. concharum* and *D. ater*, which he distinguished by the size and shape of their

posterior chaetae. He was, in fact, confusing juvenile and adult individuals of *D. concharum*, although specimens of Caullery & Mesnil's form B must also have been present, as McIntosh referred to a large epitokous male. McIntosh (1915) added to this confusion by placing *D. concharum* and *H. ater* in different genera. He included *H. saxicola* in the synonymy of *D. concharum*, but for *H. ater* also he stated: 'The *H. saxatilis* [sic] of Grube ... may be the same or an allied form'. His uncertainty about the distinction between *D. concharum* and *H. ater* is further illustrated by his citation of *Nereis sextentaculata* (delle Chiaje, 1822) in the synonymy of both, but this earlier name was not adopted for either. Although McIntosh cited different figures in each case (pl. 43, fig. 16 of delle Chiaje's (1822) *Memorie* for *D. concharum*, and pl. 105, fig. 16 of delle Chiaje's (1841) *Descrizione* for *H. ater*), these two figures are actually the identical illustration. The identity of delle Chiaje's species is discussed below (para. 11).

8. Dehorne (1933) studied the reproductive biology of form B of Caullery & Mesnil (1898) from Le Portel, Boulogne, France. He found it to reproduce asexually as an atoke and sexually as an epitoke. Dehorne commented that Caullery & Mesnil, although reluctant to treat their forms A, B and C as three separate species, had admitted that form B should perhaps be considered distinct, as it had distinct morphological characters, separate male and female adults, and parasites not found in forms A and C. After giving further details of taxonomic characters distinguishing the two species (i.e. form B and forms A+C, on the assumption that form C 'serait le véritable état terminal de A'), Dehorne discussed their taxonomy. The original descriptions of *Dodecaceria concharum* and *Heterocirrus ater* enabled both, he believed, to be recognized as form A, and for that species Dehorne used the name *D. concharum* on the basis of priority.

9. Caullery & Mesnil (1898) had noted the similarity between form B and the West Atlantic species of *Dodecaceria*, described as *Heterocirrus fimbriatus* by Verrill (1879, p. 177) from off Campo Bello Island, Bay of Fundy, Canada, burrowing in dead shells of *Pecten tenuicostatus* (= *Placopecten magellanicus* (Gmelin, 1791)) at a depth of 110 metres. Caullery subsequently examined living, fixed and sectioned material of *D. fimbriata* and thought that it differed from European examples of form B. Dehorne (1933), relying on that opinion, proposed the name *D. caulleryi* for the specimens of form B from Boulogne. Although Dehorne's type material was destroyed during the Second World War, there is no doubt about its identity. The segregation of *D. caulleryi* from *D. concharum* effectively defined *D. concharum*, and these names have been in general use since that time. The findings of Caullery & Mesnil and Dehorne were confirmed and added to by Gibson & Clark (1976) and Gibson (1977, 1978, 1981), who showed that *D. concharum* is a single parthenogenetic species which reproduces annually and, if individuals live long enough, becomes epitokous. Its diploid chromosome number is 6, compared with 12 for *D. caulleryi* (= *D. fimbriata*, see para. 10 below). Trochophore larvae from eggs spawned into the tube of *D. concharum*, reared in an aquarium, developed into young atokes of the adult. These observations showed unquestionably that the two taxa are not forms of the same species.

10. Gibson (1979) compared *D. caulleryi* from Cullercoats Bay, Northumberland, England, and from Cap Gris-Nez, France (near Dehorne's type locality for *D. caulleryi* at Le Portel), with *D. fimbriata* from the east coast of North America and

considered them synonymous. Verrill's (1879, p. 178) original description was for the epitoke. Gibson examined this specimen together with an atoke Verrill had from the same Canadian locality, and compared the reproductive cycles of individuals from Cullercoats and Cap Gris-Nez with data gathered by Martin (1934) from the east coast of North America. Asexual regenerates of *D. fimbriata*, described in detail (as *D. caulleryi*) by Dehorne (1933) and Gibson & Clark (1976), have elsewhere been interpreted as species of CTENODRILIDAE. *Ctenodrilus monostylos* Zeppelin, 1883 and *Zeppelina mediopigmentata* Gillandt, 1979 were shown by George & Petersen (1991) to be based on such developmental stages.

11. Delle Chiaje (1822, pl. 43, fig. 16; 1828, p. 176) first described *Nereis sextentaculata* from crevices and holes on the shore near Naples, Italy. The cephalic region bore six 'tentacles' on each side ('tentaculis sex unoquoque latere'). In 1841 (p. 97) delle Chiaje provided a very similar description in Italian, but transferred the species to *Lycastis*. Plate 43 of 1822 was reissued as pl. 105 of the 1841 work. The name *N. sextentaculata* may be a senior synonym of either *D. concharum* or *D. fimbriata*, both of which are likely to occur at Naples, but the brief and inadequate description makes its identity uncertain. McIntosh (1915) cited it as a synonym of both *D. concharum* and *H. ater* (see para. 7 above), but did not adopt it. Fauvel (1927) included it as a very doubtful synonym of *D. concharum* agg., while Hartman (1959) placed it merely as a possible syllid or cirratulid. The name is not in use but should be suppressed as a potential threat to later names.

12. As *D. concharum* and *D. fimbriata* (or *D. caulleryi*) are morphologically similar they are frequently both recorded in faunal studies under the aggregate name *D. concharum*, but both species are listed separately (using the name *D. caulleryi*) in the marine faunas of Plymouth (Marine Biological Association, 1957), Roscoff (Cabioch, L'Hardy & Rullier, 1968), the Cullercoats district (Garwood, 1982) and the *Directory of the British marine fauna and flora* (Howson, 1987). The geographical distribution of the two species suggests that *D. concharum* does not occur where the salinity is reduced to below about 34 parts per thousand. High precipitation in northern Norway reduces the salinity of fjords, and the outflow of the Baltic affects the Kattegat, Skagerrak and its approaches. At 20 sites along the west coasts of Sweden and Norway, the east and west coasts of Denmark and the west coast of Germany, 216 specimens of *Dodecaceria* collected were all *D. fimbriata* (Gibson, in press). Both species are found along the coasts of the English Channel, but along the western coast of Scotland *D. concharum* seems to be found only on islands, and not in lochs where again high precipitation reduces salinity. There is a possibility that the early developmental stages, rather than the adults, are sensitive to reduced salinity. Many of the coelomic trochophore larvae in specimens from the Channel were found by Marcel (1963) to be abnormal. The ability of *D. fimbriata* to reproduce asexually may allow that species to penetrate less saline waters.

13. The only species of *Dodecaceria* now found in the Öresund, at the Danish type locality for *D. concharum*, is *D. fimbriata*. In the absence of type material of *D. concharum*, and considering the geographical distribution of the two species, the assumption must be that Örsted was in fact describing the species now known as *D. fimbriata* when he proposed the name *D. concharum*. Consequently, George & Petersen (1991) proposed that the name *D. concharum* Örsted be used for the species generally known as *D. fimbriata* (or *D. caulleryi*), and that *D. ater* (Quatrefages, 1865)

be resurrected as the oldest available name for the parthenogenetic species, *D. concharum* of authors. They cited *Terebella ostreae* Dalyell, 1853 as a synonym of *D. concharum* Örsted, 1843, i.e. *D. fimbriata* auctt., but gave no evidence to support this interpretation of a name which has (see para. 2 above) always been accepted as a synonym of *D. concharum* auctt. *Terebella ostreae* and *Heterocirrus saxicola* (which George & Petersen admit is 'very similar to *D. ater* and may prove to be identical with it'), are both senior to *D. ater* and would in any case threaten the valid usage of that name. If generally adopted, the transfer by George & Petersen of the name *D. concharum* to the species known as *D. fimbriata* (or *D. caulleryi*), and their use of the name *D. ater* for the species known for more than a century as *D. concharum* Örsted, 1843, would lead to serious confusion. Petersen & George (1991, p. 200) have already used the name *D. concharum* when referring to previous work on *D. caulleryi*. Such name changes complicate the already difficult separation of these two species.

14. In the absence of extant type material and because of the probability that the species as generally interpreted does not occur at the published type locality, we propose that the current usage of the name *Dodecaceria concharum* be maintained in the interests of nomenclatural stability by the designation of a neotype. The proposed neotype, deposited in the National Museums of Scotland, Edinburgh (catalogue no. NMSZ 1993063), is from Cullercoats, Northumberland, England, collected by P.H. Gibson on 9 December 1969. The name *D. fimbriata* (Verrill, 1879) will also be conserved by this action. We propose that the specific name of *Nereis sextentaculata* delle Chiaje, 1822 be suppressed, since it may threaten both *concharum* and *fimbriata* (see para. 11 above), and that the specific name of *Terebella ostreae* Dalyell, 1853 be suppressed as it may threaten *fimbriata* (see para. 2 above). We also propose that the specific names of *Heterocirrus saxicola* Grube, 1855 and *H. ater* Quatrefages, 1865 be suppressed; we believe these names to be synonymous with *concharum* but this is only subjective. If they are synonymous with *fimbriata* instead they are both senior to that name and could potentially upset stability. George & Petersen admit that *saxicola* and *ater* may prove to be identical and, on present evidence, if our application is not approved, *saxicola* (not *ater*) would be the oldest name for *concharum* of authors.

15. The International Commission on Zoological Nomenclature is accordingly asked:

(1) to use its plenary powers:

(a) to set aside all previous type fixations for the nominal species *Dodecaceria concharum* Örsted, 1843 and to designate as neotype the specimen proposed in para. 14 above;

(b) to suppress the following specific names for the purposes of the Principle of Priority but not for those of the Principle of Homonymy:

(i) *sextentaculata* delle Chiaje, 1822, as published in the binomen *Nereis sextentaculata*;

(ii) *ostreae* Dalyell, 1853, as published in the binomen *Terebella ostreae*;

(iii) *saxicola* Grube, 1855, as published in the binomen *Heterocirrus saxicola*;

(iv) *ater* Quatrefages, 1865, as published in the binomen *Heterocirrus ater*;

(2) to place on the Official List of Generic Names in Zoology the name *Dodecaceria* Örsted, 1843 (gender: feminine), type species by monotypy *Dodecaceria concharum* Örsted, 1843;

- (3) to place on the Official List of Specific Names in Zoology the following names:
 - (a) *concharum* Örsted, 1843, as published in the binomen *Dodecaceria concharum* (specific name of the type species of *Dodecaceria* Örsted, 1843), and as defined by the neotype designated in (1)(a) above;
 - (b) *fimbriatus* Verrill, 1879, as published in the binomen *Heterocirrus fimbriatus*;
- (4) to place on the Official Index of Rejected and Invalid Specific Names in Zoology the following names:
 - (a) *sextentaculata* delle Chiaje, 1822, as published in the binomen *Nereis sextentaculata* and as suppressed in (1)(b)(i) above;
 - (b) *ostreae* Dalyell, 1853, as published in the binomen *Terebella ostreae* and as suppressed in (1)(b)(ii) above;
 - (c) *saxicola* Grube, 1855, as published in the binomen *Heterocirrus saxicola* and as suppressed in (1)(b)(iii) above;
 - (d) *ater* Quatrefages, 1865, as published in the binomen *Heterocirrus ater* and as suppressed in (1)(b)(iv) above.

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